

TAXONOMIC NOTES ON THE SUBSPECIES OF THE INDIAN MUNTJAC (*Muntiacus muntjak*) IN YUNNAN, CHINA

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Abstract

The present paper deals with the taxonomy of the Indian muntjac in Yunnan, China. After examining more than the sixty specimens of *Muntiacus muntjak* from over the great part of the area of Yunnan, we think that the population of *M. muntjak* living in the place cannot be included in *M. m. vaginalis*, we treat it as two new subspecies, which are *M. m. menglalis* and *M. m. yunnanensis*. The former is distributed in the south of 22°30'N., and the latter north of 23°10'N..

Key words (关键词): Indian muntjac, *Muntiacus muntjak* (赤麂),

Classification (分类), New subspecies (新亚种), Yunnan (云南).

INTRODUCTION

Indian muntjac (Barking deer), *Muntiacus muntjak*, is a species of small-sized plant-eating ungulates, which exists widely in the tropical and subtropical area of East and Southeast Asia. It is a fur-bearer of considerable economic value, and its distribution area is the broadest of all species of *Muntiacus*.

So far, altogether 15 subspecies of *M. Muntjak* have been named, seven of which are found on the mainland of South and Southeast Asia and on Hainan island of China (Ellerman et al., 1951), other eight subspecies live in the various islands of Southeast Asia (Chasen, 1940). Recently, one of us (Groves, in collaboration with P. Grubb, in press) has reduced the 15 subspecies to eight as follows:

1. *Muntiacus muntjak muntjak* (Zimmermann, 1780)

Diagnosis: Body larger (greatest skull length—mean 207.5mm); antler long (80–200mm); forehead light cinnamon-rufous; deep rufous in colour of the body, ear-backs usually dark; the nape dusky, markedly different from body tone; midregion of back dark chestnut, almost forming a broad dorsal stripe; skull relatively narrow at mastoid; nasal short in male, and longer in female.

2. *Muntiacus muntjak montanus* Robinson and Kloss, 1918

Diagnosis: Body medium size (greatest skull length—mean 193mm); antler shorter

Acknowledgements: We thank Mr. Xu Longhui, of Guangdong Institute of Entomology, for some valuable suggestions and for supplying part of materials on the study of Hainan subspecies, and Mr. Yang Pingkang, of the Kunming Institute of Zoology, for making the illustrations.

Received August 24, 1987.

(under 100mm), often unbranched; pedicel stripes thick; skull narrow; much dark in colour, overall dark chestnut with blackish; the front of thighs (to hocks) is only ochery, not white; the back of tail blackish brown.

3. *Muntiacus muntjak malabaricus* Lydekker, 1915

Diagnosis: This is smallest mainland subspecies (greatest skull length—mean 178.1mm); antlers shorter (60–100mm), pedicels very short; general colour washed-out reddish, with much greying on nape back; underside drab; white area on lower limbs prominent and extending round to front of pasterns, limiting reddish colouration to a narrow band down the limb.

4. *Muntiacus muntjak aureus* (H. Smith, 1826)

Diagnosis: Body larger (greatest skull length—mean 188.8mm); antlers small in size, and shorter (70–100mm); body colour pale yellowish; limbs coloured more or less the same as body; a white line down front of thighs to hocks.

5. *Muntiacus muntjak nigripes* G. Allen, 1930

Diagnosis: Body smaller (greatest skull length—mean—185mm); antler medium size, the pedicels (75–107mm) longer than the antler (53–96mm); body colour bright orange, with no darkening on midback; shanks darkened, usually blackish-grey.

6. *Muntiacus muntjak vaginalis* (Boddaert, 1785)

Diagnosis: Body larger (greatest skull length—mean 200mm); antlers bigger and long (80–120mm), body dark reddish, darker on midback than flanks; groin and line on front of hindlegs to hocks white; limbs dark brown to grey.

7. *Muntiacus muntjak curvostylis* (Gray, 1872)

Diagnosis: Body large (greatest skull length—mean 211.1mm); antlers large and long (89–130mm); body colour light reddish-yellow, midback tending to be darker, but the two tones grading, not sharply distinct; the colour of limbs as body, but the shanks greyer; throat buff-white.

8. *Muntiacus muntjak annamensis* Kloss, 1928

Diagnosis: Body medium (greatest skull length—mean 204.3mm); antlers very long (100–130mm); hair colour similar to *M. m. curvostylis*, but the nape less grey tone, shanks as of body, or greyer in midline; no white line on hindlegs, only pasterns with a few white marks, on upper side of tail is very red.

RESULTS AND DISCUSSION

No special study has been made on the Indian muntjac of Yunnan. Osgood (1932) and Allen (1940) incorporate the Indian muntjacs of Northern Vietnam and Yunnan into the Himalayan subspecies (*Muntiacus muntjak vaginalis*). Since then, most Chinese scholars have followed this viewpoint in reports on the taxonomy and fauna, even regarding the Indian muntjac in Chinese mainland as *M. m. vaginalis* (Gao Yaoting et al., 1962; Wang Song et al., 1962; Peng Hongshou et al., 1962; Lu Changkuen et al., 1965; Shou Zhenhuang et al., 1966; Wang Yuxi et al., 1983).

After examining more than sixty specimens of *Muntiacus muntjak* collected over the greater part of the area of Yunnan, we conclude that the population from Southern and northern Yunnan diverge considerably from *M. m. vaginalis*. It is obvious that the Indian muntjac of the two areas are not the same subspecies; and that both differ from those which exist in other regions of China, Northern Burma, Northern Vietnam, Laos and the Himalayas, and cannot be included in *M. m. vaginalis*. The genuine *M. m. vaginalis*, in fact, is limited in Nepal, Sikkim, Northeast India, Arakan in Western Burma, and Southeast Xizang (Tibet) in China (Grubb & Groves, in press).

For these reasons, we here describe the Indian muntjacs from Yunnan and its southern borders with Burma, Laos and Vietnam as two new subspecies.

1. *Muntiacus muntjak menglalis* Wang et Groves, subsp. nov.

Holotype: KIZ 70, male (ad.), collected on March 11, 1960, from Pujiao, Mengla

county, Southern Yunnan (Xishuanbanna) .

Paratype: KIZ 650507, male(ad.), collected in May, 1966, from Yingpan Heishan, South Yunnan.

Specimens examined: four males, four females (skins and skulls) , five skins of no exact sex: Mengla (skins and skulls) one male (ad.) , one female(ad.) , one male and one female (infants), two skins of females (ad.) ; Jiangcheng one male (subad.) ; Lu-Chun one male (ad.) ; Jinping two skins (ad.)

Measurements (see Table 1) .

Diagnosis: This subspecies is of medium size, weighing 22-30kg, the antler is distinctly longer than the antler pedicel (by more than 30-50mm) ; the colour of the limbs (anterior and external surfaces) is light orange, similar in tone to the body. Canine of male short, generally only 20-25mm, with an absolute maximum of 30mm.

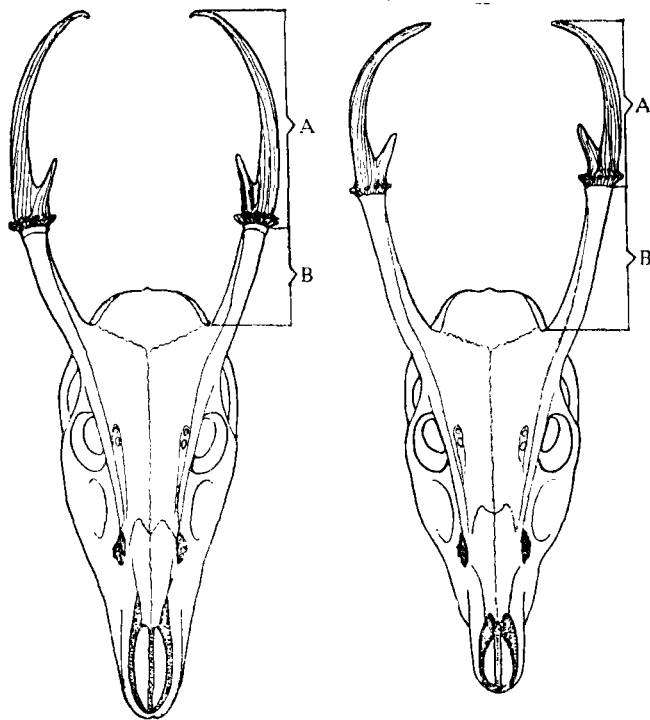


Fig.1 Comparison of antlers with pedicels length of two new subspecies in *M. muntjak*.

图1 云南赤麂两新亚种角和角柄长度的比较

Left左: *Muntiacus muntjak menglalis* subsp. nov. 勐腊亚种, 新亚种。

Right右: *Muntiacus muntjak yunnanensis* subsp. nov. 云南亚种, 新亚种。

A. The greatest length of antler 最大角长, B. The greatest length of pedicel 最大柄长。

Description: In size, *M. m. menglalis* is larger than the Hainan subspecies (*M. m. nigripes*) , Himalayan subspecies (*M. m. vaginalis*) , and *M. m. malabaricus* of Sri Lanka, S.W. India, but closer to *M. m. curvostylis* of Thailand and *M. m. aureus* of central Burma to N.W. India. Antler longer (87-101mm) *, antler pedicel shorter (43-68mm) . Antler pedicels are light brown in front; inside of the ear, Chin and throat pale white. Axillae, inner surface of the upper part of the limbs, buttocks and underside of the tail are all a pure white. The colour of the hair of the rest of the body is wholesale light orange,

* The holotypes and paratypes are all kept in Kunming Institute of Zoology, Academia Sinica, Kunming.

* For method measurement of length of antler and pedicel, see Figure 1.

with the underparts relatively pale.

Skull is medium-sized, and distinctly larger than *M.m.vaginalis*, *M.m.nigripes*, *M.m.malabaricus* or *M.m.annamensis* of Southern Vietnam. Its size is most similar to that of Thailand subspecies *M. m. curvostylis*. The bilateral bony projections in the middle of nasals are comparatively longer, so the nasal is comparatively short and wide.

Remarks: Prior to the present study, the Indian muntjac of Xishuanbanna in Southern Yunnan and adjacent regions was long regarded as *M.m.vaginalis* (Osgood, 1932 Ellerman and Morrison-Scott, 1955; Gao Yaoting et al., 1962). Skull measurements and the structure and form of the antler and pedicel are however quite different (see Table 2 and 3, Fig.1), although there is little or no difference from *M.m.vaginalis*, *M.m.curvostylis* and *M. m. annamensis* in hair colour. When the new subspecies (*M.m. menglalis*) is compared with *M.m.vaginalis* and *M.m.annamensis* in greatest skull length and condylobasal length the coefficients of difference (C.D.) reach at least 1.33. The difference between the new subspecies and *M.m. curvostylis* is mainly in the length of the antler (C. D. = 1.78). The new subspecies differs from those in Hainan island and

Table 1 The measurements of two new subspecies of *M.muntjak* in Yunnan (Weight: kg, Length: mm)

表1 云南赤鹿两个新亚种的测量 (重量: 千克; 长度: 毫米)

	<i>M.m.menglalis</i> subsp. nov. 勐腊亚种, 新亚种				<i>M.m.yunnanensis</i> subsp. nov. 云南亚种, 新亚种			
	Holotype	Paratype	Specimens examined	N	Holotype	Paratype	Specimens examined	N
	♂(ad.) 正模	♂(ad.) 副模	♀♂(ad.) 查看标本		♂(ad.) 正模	♀(ad.) 副模	♀♂(ad.) 查看标本	
Body weight 体重	—	—	25.5 ± 1.75 (22 - 30.5)	4	33.0	28.0	28.11 ± 0.96 (26 - 33)	9
Head and body 体长	1050.0	1060.0	1110.8 ± 61.81 (1000 - 1350)	5	1120.0	1045.0	1049 ± 16.91 (955 - 1200)	16
Tail length 尾长	150.0	144.0	183.8 ± 8.01 (140 - 200)	5	175.0	195.0	177.8 ± 5.32 (145 - 215)	16
Hind foot 后足长	—	250.0	265.0 ± 9.16 (250 - 295)	5	295.0	310.0	289.7 ± 3.93 (255 - 310)	16
Ear length 耳长	70.0	100.0	115.2 ± 9.86 (70 - 150)	6	98.0	117.0	104.7 ± 1.93 (95 - 120)	15
Greatest skull length 颅全长	216.1	213.5	213.2 ± 2.69 (207 - 216)	5	225.1	220.0	210.7 ± 1.72 (192 - 225)	18
Basal length 基长	195.8	198.8	194.1 ± 3.61 (185 - 199)	5	210.3	210.0	194.7 ± 1.69 (185 - 210)	16
Occipitonasal length 枕鼻长	176.3	183.5	178.5 ± 2.37 (174 - 185)	6	185.7	190.0	179.1 ± 2.19 (160 - 198)	16
Nasal length 鼻骨长	56.0	59.0	57.6 ± 1.35 (55 - 61.1)	6	58.4	65.0	58.7 ± 0.87 (54.8 - 65.0)	18
Antler length 角长	98.7	101.0	94.5 ± 3.26 (87 - 101)	4	88.5	—	87.1 ± 4.30 (67.7 - 101.6)	14
Pedicel length 角柄长	43.8	64.0	56.4 ± 5.36 (43.8 - 68.2)	4	77.2	—	78.5 ± 1.50 (68 - 87.4)	14
Canine length 犬齿长	—	23.2	23.3 ± 0.95 (20.3 - 25)	4	36.7	—	30.7 ± 1.28 (25.6 - 36.7)	9
Upper cheek teeth 上颊齿长	57.3	58.2	59.0 ± 1.39 (56.2 - 60.5)	5	64.6	60.4	62.9 ± 0.58 (59.4 - 65)	16

Note: N, no. of specimens 标本数.

Table 2 Comparison of the measurements of ten subspecies in *Muntiacus muntjak* (mm)

表2 赤麂10个亚种的量度比较(毫米)

	Greatest skull length 颅全长			Basal length 基长			Nasal length 鼻骨长			Antler length 角长			Pedicel length 角柄长			Distribution 分布
	\bar{X}	S.D	No.	\bar{X}	S.D	No.	\bar{X}	S.D	N.o	\bar{X}	S.D	No.	\bar{X}	S.D	No.	
<i>M. m. muntjak</i> 指名亚种	207.5	6.90	17	181.5	6.33	15	49.9	4.43	25	110.6	9.39	28	—	—	—	Java 爪哇
<i>M. m. monianus</i> 印尼亚种	193.0	6.56	7	—	—	—	—	—	—	—	—	—	—	—	—	Aceh (亚齐) 印度尼西亚 Kerinci (克林季) 印度尼西亚
<i>M. m. malabaricus</i> 印斯亚种	178.1	6.34	9	158.3	4.71	8	44.8	3.04	9	102.2	14.89	7	—	—	—	Sri Lanka 斯里兰卡 S. W. India 印度西南部
<i>M. m. aureus</i> 印缅亚种	188.8	6.53	5	161.5	2.38	4	51.5	3.51	6	110.3	9.07	3	—	—	—	N. W. India 印度西北部 Cent. Burma 缅甸中部
<i>M. m. nigripes</i> 海南亚种	185.0	6.66	6	175.9	4.19	8	47.8	4.40	6	71.8	17.46	6	89.0	11.68	6	Hainan island 海南岛
<i>M. m. vaginalis</i> 喜马拉雅亚种	200.1	6.15	25	175.9	5.20	23	54.9	3.58	34	99.2	19.63	5	—	—	—	Nepal 尼泊尔 N. E. India 印度东北部 Arakan, Burma 阿拉刚 (缅甸)
<i>M. m. curvostylis</i> 泰北亚种	211.2	5.13	13	185.6	6.33	11	56.8	3.73	16	132.3	14.74	3	—	—	—	N. Thailand 泰国北部 Victoria Pt. 维多利亚角 (缅甸) (Burma)
<i>M. m. annamensis</i> 越南南部亚种	204.3	7.33	8	179.3	5.74	6	54.2	5.23	11	120.5	—	—	—	—	—	S. Vietnam 越南南部
<i>M. m. mengialis</i> subsp. nov. 勐腊亚种 (新亚种)	213.2	1.65	5	194.1	5.41	5	57.6	2.29	6	94.5	6.52	4	56.4	10.71	4	S. Yunnan 云南南部 N. Burma, Laos 缅甸、老挝北部 N. Vietnam 越南北部
<i>M. m. yunnanensis</i> subsp. nov. 云南亚种 (新亚种)	210.7	6.64	16	194.7	8.26	16	58.7	3.63	18	87.1	12.18	18	78.5	5.60	14	C. and N. Yunnan 云南中部和北部

Table 3 Coefficient of difference (C.D.) *of ten subspecies in *Muntiacus muntjak*

表3 赤鹿10个亚种的差异系数

	Body weight 体重 (C.D.)	Hind foot 后足长 (C.D.)	Greatest skull length 颅全长 (C.D.)	Condylar basal length 颌基长 (C.D.)	Nasal length 鼻骨长 (C.D.)	Antler length 角长 (C.D.)	Pedicle length 角柄长 (C.D.)	Pedicle/Antler % 角柄/角% (C.D.)	Canine length 犬齿长 (C.D.)
Mmm ¹ /Mmm ⁴	—	—	0.67	1.07	1.15	1.01	—	—	—
Mmm ² /Mmm ⁴	—	—	2.46	—	—	—	—	—	—
Mmm ³ /Mmm ⁴	—	—	4.39	3.54	2.40	0.36	—	—	—
Mma ¹ /Mmm ⁴	—	—	2.98	4.18	1.05	1.01	—	—	—
Mmn/Mmm ⁴	—	1.27	1.05	1.90	1.46	—	1.49	—	—
Mmc/Mmm ⁴	—	—	0.23	0.72	0.13	1.78	—	—	—
Mma ² /Mmm ⁴	—	—	0.81	1.33	0.45	—	—	—	—
Mmv/Mmm ⁴	—	—	1.33	1.72	0.46	—	—	—	—
Mmm ¹ /Mmy	—	—	0.24	0.90	1.09	1.09	—	—	—
Mmm ² /Mmy	—	—	1.34	—	—	—	—	—	—
Mmm ³ /Mmy	—	—	2.51	2.81	2.08	0.56	—	—	—
Mma ¹ /Mmy	—	—	1.67	3.40	1.01	1.09	—	—	—
Mmn/Mmy	2.09	2.45	1.93	1.51	1.35	—	—	—	—
Mmc/Mmy	—	—	0.35	0.55	0.21	1.68	—	—	—
Mma ² /Mmy	—	—	0.20	1.09	0.47	—	—	—	—
Mmv/Mmy	—	—	0.55	1.44	0.48	—	—	—	—
Mmm ⁴ /Mmy	0.72	0.57	0.73	0.05	0.18	0.40	1.37	1.38	1.29

Mmm¹ = *M. m. muntjak* (指名亚种), Mmm² = *M. m. montanus* (印尼亚种), Mmm³ = *M. m. malabaricus* (印斯亚种), Mma¹ = *M. m. aureus* (印缅亚种), Mmn = *M. m. nigripes* (海南亚种), Mmv = *M. m. vaginalis* (喜马拉雅亚种), Mmc = *M. m. curvostylis* (泰北亚种), Mma² = *M. m. annamensis* (越南南部亚种), Mmm⁴ = *M. m. menglalis* subsp. nov. (勐腊亚种, 新亚种), Mmy = *M. m. yunnanensis* subsp. nov. (云南亚种, 新亚种)

* According to Mayr (1953)'s method, so long as the "C.D." of the any one character in two samples is over 1.28. The two samples can be separated as the different subspecies. 据麦尔 (1953) 的方法, 在两个类型中, 只要任何一项特征的差异系数 (C.D.) 在 1.28 以上, 这两个类型就可区分为两个不同的亚种。

north-central Yunnan (north of 23°10'N.), having the C. D. of three measurements above 1.28 in each case (Table 3). The new subspecies is larger than Hainan muntjac, *M. m. nigripes*, and the colour is not as dark. On the comparison of *M. m. menglalis* with the form from Northern Yunnan, see below:

In view of these clear and stable differences, and the well separated geographic distributions, the evidence is quite clear that the Indian muntjac of southernmost Yunnan should be classed as a new subspecies.

Etymology: named for Mengla county, southern Yunnan, at the centre of the range of the new subspecies.

Distribution: As far as we know the distribution of the new subspecies comprises the whole of Xishuanbanna, Lancang Lahuzu Zizhixian, Jiangcheneng Hani-zu Yizu Zizhixian, Jinping county and Luchun county in southern Yunnan, China, and including the adjacent borders of Burma, Laos and Vietnam (west of the Red River).

2. *Muntiacus muntjak yunnanensis* Ma et Wang, subsp. nov.

Holotype: KIZ 830013, male(ad.), collected on December 12, 1983, from Wokang Dashan (23°20'N., 99°13'E., elevation 2200 metres), Menglai, Cangyuan Vazu Zizhixian in west Yunnan, by Wang Quan.

Paratype: KIZ 640107, female(ad.), collected on November 4, 1964, from Jingdong Wuliang Mountain (24°25'N., 100°39'E., elevation about 2400 metres) in central Yunnan by Li Zhixiang.

Specimens examined: 23 males, 18 females (skins and skulls) and five skins, sex unknown; Cangyuan one male(ad.); Genma one male(ad.); Yingjiang three females(ad.); Tengchong one male(subad.), one female(infant); Jingdong six males(ad.), eight females(ad.), one female(subad.), one female(infant); Dayao one male(subad.); Wuding one female(infant); Yu-an-shan in Kunming one male(ad.); Ailao Mountain in Xinping one male(ad.); Zhenyuan one female(ad.); Chengjiang one male(ad.); two other male(ad.) and one female(subad.) of no exact locality.

Measurements: (see Table 1)

Diagnosis: This is a subspecies of fairly large size, weight about 30kg, some individuals reaching over 33kg; antler almost equals to pedicel in length, the difference between two being about 15mm; male with longer canine, average length about 30mm; external and anterior surfaces of the limbs and shoulders dark chestnut or black-brown.

Description: Body weight 26-33kg in adult; hair of surface of body mostly deep red-brown; lips, nose, cheeks, forehead and nape dark brown; surface of pedicels are almost black-brown; inside ears pale white; tips and bases of dorsal hair dark brown, shafts chestnut. Flanks and underparts of body grey-chestnut; chin, throat, armpit, inside of thigh, buttocks and under the tail pure white; colour of limbs and shoulders dark chestnut or black-brown, forming a sharp contrast with the other parts of body, the black colour reaching further than in the Hainan subspecies (*M. m. nigripes*); the white lines running down the insides of the hind limbs extending beyond the knee joints; base of hoof with pale white or yellow white patch.

The greatest skull length of the subspecies is large size among the subspecies of *M. muntjak*; and pedicels markedly lengthened, averaging about 77.8mm, the longest of all subspecies.

Remarks: This new subspecies (*M. m. yunnanensis*) of *M. muntjak*, from central and northern Yunnan, differs from other subspecies from both the mainland and Hainan island chiefly in its markedly lengthened antler pedicels. Body is large and the colour darker, especially on the limbs and shoulders, which are the most darkened of all subspecies of *M. muntjak*. The greatest skull length (mean 210.7mm, n=18) less than *M. m. menglalis* (mean 213.2mm, n=5) and *M. m. curvostylis* (mean 211.2mm, n=13), but greater than *M. m. vaginalis* (mean 200.1mm, n=14), *M. m. annamensis* (mean 204.3mm, n=8), *M. m. muntjak* (mean 200.4mm, n=52), *M. m. montanus* (mean 193.0mm, n=7), *M. m. malabaricus* (mean 178.1mm, n=9), *M. m. aureus* (mean 188.8mm, n=5) and *M. m. nigripes* (mean 180.3mm, n=47).

Table 3 demonstrates that *M. m. yunnanensis* differs from its adjacent subspecies, apart from *M. m. annamensis* of southern Vietnam, all having the C.D. of one to three characters above 1.28, well above the conventional level of subspecific difference. *M. m. yunnanensis* differs from *M. m. annamensis* by the length of the antler and the colour of limbs and shoulders: in the former, the antler is markedly shorter (67.7-101.6mm), the colour of the limbs and shoulders is very dark; in the latter, the antler is distinctly longer (102-139mm), the colour of the limbs and shoulders is particularly light. The ranges of *M. m. curvostylis* and *M. m. menglalis* intervene between the two subspecies.

The differences between *M. m. yunnanensis* and *M. m. menglalis* are in body size,

* This is a specimen which has only recently reached maturity and with soft antler, collected in August, by Mr Han Lianxian of Kunming Institute of Zoology.

colour and the ratio of antler to pedicel (Fig. 1). From Fig. 1 can be seen that the pedicel is about a half of the antler length in *M.m.menglalis*, but the pedicel of *M.m.yunnanensis* is over three-quarters of the antler length, antlers being actually shorter than the pedicels.

Distribution: From the available data, the new subspecies is restricted to the centre and north of Yunnan—north of $23^{\circ}10'N$. Where the ranges of *M.m.menglalis* and *M.m.yunnanensis* meet (the counties of Jinping, Luchun and Lancang), *M.m.menglalis* occurs below 2000 meters a.s.l. and *M.m.yunnanensis* only lives in the higher mountains over 2000 meters. Whether the Indian muntjac of the eastern area of Yunnan, adjoining Geizhou and Guangxi provinces, are *M.m.yunnanensis* or some other form, cannot be decided because of lack of specimens.

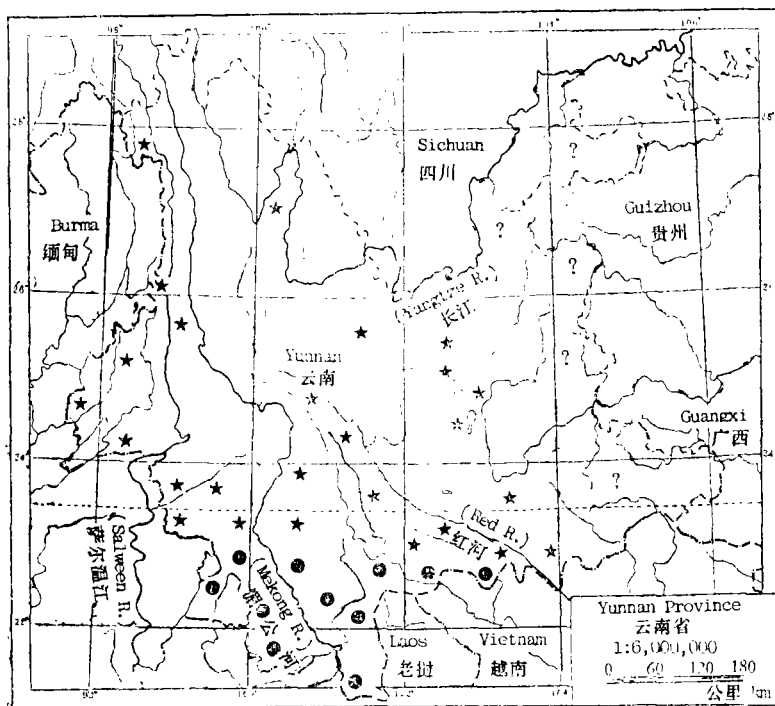


Fig.2 Distribution of two new subspecies of *M.muntjak* in Yunnan

图2 云南赤鹿两新亚种的分布

● *M.m.menglalis* subsp. nov. 勐腊亚种, 新亚种.

★ *M.m.yunnanensis* subsp. nov. 云南亚种, 新亚种.

To sum up, it has been necessary to distinguish two new subspecies of the Indian muntjac of Yunnan. The boundary between the two new subspecies is not a natural barrier, but has a narrow transitional belt ($22^{\circ}30'N$.- $23^{\circ}10'N$.). Here have been found intermediates between the two new subspecies. We have mentioned above that both latitude and elevation influence the differentiation of the two new subspecies.

The subspecies of *M.muntjak* of mainland China (not including Yunnan and Xizang) remain a problem. We lack enough skulls of males of this species from these areas, so we put off discussion in the present paper. This question deserves further study in the future.

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中文摘要

云南赤麂的亚种分类记述

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赤麂 (*Muntiacus muntjak*) 又名印度麂或吠鹿, 广泛分布于亚洲南部的热带和亚热带地区, 为麂属中数量最多, 分布最广的一种。同时又是具有较高经济价值的毛皮兽。迄今, 本种已记载过15个亚种, 其中7个分布于中国大陆 (Ellerman 和 Morrison-Scott, 1951), 8个见于东南亚诸岛 (Chasen, 1940)。近来, 本文作者之一的Groves和他的同事Grubb又将这15个亚种归并为8个 (论文已交付出版)。

关于云南赤麂的亚种问题以往很少深入研究, 仅在部份区系分类报告中有过简要记载。但因各学者所获标本有限 (或者仅得少数皮张), 而将云南及整个中国大陆的赤麂

(*Muntiacus muntjak*)统统归入了*M.m.vaginalis*亚种。事实上,真正的*M.m.vaginalis*仅局限于尼泊尔,锡金,印度东北部,缅甸西部的阿拉刚(Arakan)和中国的西藏东南部(Grubb和Groves,待发表)。

笔者查看了采自云南各地的60余号赤麂标本,经与已知亚种的外部形态、头骨特征和主要性状差异系数值的比较(表3)发现:云南的赤麂不仅与*M.m.vaginalis*,海南亚种*M.m.nigripes*以及邻国的其它亚种(如*M.m.curvostylis*和*M.m.annamensis*等)明显有别,而且与中国的四川、贵州和广西等省的标本差异亦颇大。就说云南南北(约为22°20'N.以南;23°10'N.以北)两地标本的差异也十分显著(两地之间有一狭窄的过渡地带,发现有居间类型存在)。因此,我们将这两地的赤麂建立为两个不同的新亚种。南部的为勐腊亚种*M.m.menglalis*;北部订名为云南亚种*M.m.yunnanensis*(分布详见图2)。有关两新亚种间以及它们与原有亚种的主要差异详见正文、图1和表1—3。两新亚种的主要鉴别特征如下:

1. 勐腊亚种*M.m.menglalis* Wang et Groves

体型中等,体重22—30千克。雄性犬齿较短,很少超过30毫米。角显著长于角柄。四肢的前、外侧与体毛均呈一致的亮桔黄色。

2. 云南亚种*M.m.yunnanensis* Ma et Wang

体型较大,体重多为26—33千克。犬齿较长,通常在30毫米以上。角柄显著延长,约等于角长。体毛较深暗。四肢的前、外侧及肩部具暗棕或黑褐色,其深暗程序有甚于海南亚种。